

Claims

- [c1] A method of evaluating changes for a wellbore interval, comprising:
 - obtaining first log data acquired by a logging sensor during a first pass over the wellbore interval;
 - obtaining second log data acquired by the logging sensor during a second pass over the wellbore interval;
 - calculating a plurality of delta values between the first log data and the second log data;
 - deriving an observed effect using the plurality of the delta values; and
 - identifying a correlation between the observed effect and a causal event.
- [c2] The method of claim 1, further comprising displaying the correlation on a display device.
- [c3] The method of claim 1 or 2, wherein the second log data is acquired at a time later than the first log data.
- [c4] The method of any of claims 1-3, wherein the logging sensor measures at least one parameter selected from the group consisting of gamma ray, resistivity, neutron porosity, density, ultrasonic caliper, and sigma.
- [c5] The method of any of claims 1-4, wherein the logging sensor is disposed on an integrated measurement tool.
- [c6] The method of any of claims 1-5, wherein the correlation is a depth correlation.
- [c7] The method of any of claims 1-6, wherein the correlation is a time correlation.

- [c8] The method of claim 1, further comprising:
calculating a relative effect using a sensitivity factor to adjust the correlation; and
displaying the correlation and the relative effect on a display device.
- [c9] A system for evaluating changes for a wellbore interval comprising:
a well log data acquisition system for acquiring first log data and second log data
from a logging sensor during a plurality of passes over the wellbore
interval; and
a well log data processing system for:
calculating a plurality of delta values between the first log data and the
second log data;
deriving an observed effect using the plurality of the delta values; and
identifying a correlation between the observed effect and a causal event.
- [c10] The system of claim 9, further comprising a display device for displaying the
correlation.
- [c11] The system of claim 9 or 10, wherein the second log data is acquired at a time later
than the first log data.
- [c12] The system of any of claims 9-11, wherein the logging sensor measures at least
one parameter selected from the group consisting of gamma ray, resistivity,
neutron porosity, density, ultrasonic caliper, and sigma.
- [c13] The system of any of claims 9-12, wherein the logging sensor is disposed on an
integrated measurement tool.
- [c14] The system of any of claims 9-13, wherein the correlation is a depth correlation.
- [c15] The system of any of claims 9-14, wherein the correlation is a time correlation.

- [c16] The system of claim 9, further comprising a well log data processing system for calculating a relative effect using a sensitivity factor to adjust the correlation; and displaying the correlation and the relative effect on a display device.
- [c17] A computer system for evaluating changes for a wellbore interval, comprising:
- a processor;
 - a memory;
 - a storage device;
 - a computer display; and
- software instructions stored in the memory for enabling the computer system under control of the processor, to perform:
- gathering first log data from a logging sensor during a first pass over the wellbore interval;
 - gathering second log data from the logging sensor during a second pass over the wellbore interval;
 - calculating a plurality of delta values between the first log data and the second log data;
 - deriving an observed effect using the plurality of the delta values;
 - identifying a correlation between the observed effect and a causal event;
 - and
- displaying the correlation on the computer display.